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10/591,611	10/15/2006	Daniel McStay	27667U	3396

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EXAMINER	
BENNETT, JENNIFER D	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,611	MCSTAY ET AL.	
	Examiner	Art Unit	
	JENNIFER BENNETT	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 12 January 2009.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,3-6,8-10,12,15,16,18 and 20-37 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,3-6,8-10,12,15,16,18 and 20-37 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to amendments and remarks filed January 12, 2009. Claims 1, 3-6, 8-10, 12, 15, 16, 18, and 20-37 are currently pending.

Claim Objections

1. Claim 35 is objected to because of the following informalities:

Re claim 35: The claim is dependent on the cancelled claim 17. For examining purposes the claim will be dependent on claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 3: It is unclear whether the Applicant is interpreting the “at least one lens” as the “at least one lens” in the “detection system” or the “at least one lens” in the “excitation system” as recited in claim 1. For examining purposes the examiner will choose the at least one lens is in the excitation system.

Re claim 10: It is unclear to the examiner how a beam that is being emitted from the fluorometer is collimated as stated in claim 1, but in claim 10 the beam is now

conical in shape with the beam diverging in a direction away from the fluorometer. The definition of a collimated beam is light hose rays are nearly parallel, and therefore will spread slowly as it propagates. For examining purposes, the beam will be collimated but not exactly parallel. There is a slight divergence in the beam but not enough to be cone-like (conical with divergence) in shape.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 3-6, 8-10, 12, 15, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bentsen et al. (US 6372895) in view of Carlson et al. (US 4771629).

Re claim 1: Bentsen teaches a fluorometer (fig. 1b) comprising an excitation system (330) including an excitation source (332) for producing excitation light capable of causing fluorescence in fluorescent material (col. 24, lines 10-33); and a detection system (340) for detecting said fluorescence (col. 24, lines 30-33), wherein said excitation system comprises an excitation source (332) comprising one or more light emitting diodes (LEDs) (col. 24, lines 10-11) associated with means for causing the excitation system (col. 24, lines 10-33) further comprising at least one lens (334) arranged to cause said excitation light to form a beam that projects, during use, from the

fluorometer (see fig. 1), and means for modulating (338) said collimated elongate beam with a modulating signal having a modulating frequency (col. 24, lines 47-57 and 65-67 and col. 25, lines 1-3), and wherein said detection system (340) comprises means for receiving light (342) and for converting said received light into a corresponding electrical signal (col. 25, lines 11-12), and at least one lens (349) arranged to direct said received light onto said light receiving and converting means (see fig. 1b), and wherein said detection system (340) further includes means for detecting, in the electrical signal produced by said light receiving and converting means, a signal component of substantially the same frequency as said modulation frequency, said detecting means including means for performing spectral analysis of said electrical signal and means for determining the value of a spectral component of said electrical signal corresponding to said modulation frequency (col. 25, lines 43-50 and 65-67, col. 26, lines 1-15), such that the fluorometer is capable of detecting to enable the detection of fluorescent material located remotely from the fluorometer (col. 26, lines 16-19). Bentsen does not specifically teach the lens in the excitation system is arranged to cause said excitation light to form a substantially collimated elongate beam to be emitted from the fluorometer. Carlson teaches a system for chemical analysis (fig. 1), comprising an excitation system (left hand side of fig. 1), comprising an excitation source (13, 15, and 17) and a lens (39) comprising at least one lens arranged to cause said excitation light to form a substantially collimated elongate beam that projects, during use, from the fluorometer (see fig. 1). It would have been obvious to one of ordinary skill in the art a the time the invention was made to use a lens as Carlson does with the fluorometer of

Bentsen in order to increase the beam size to cover a certain area depending on the size of an object or specimen being measured to provide a fluorometer that can measure larger samples.

Re claim 3: Bentsen in view of Carlson teaches a fluorometer (Carlson, fig. 1), wherein the lens system said at least one lens comprises at least one collimating lens (Carlson, col. 5, lines 52-57).

Re claim 4: Bentsen as modified by Carlson teaches a fluorometer (Carlson, fig. 1), wherein said excitation source (elements 13, 15, and 17 are all an excitation source) is located substantially at the focal point of the nearest to the excitation source of said at least one lens (39).

Re claim 5: Bentsen as modified by Carlson teaches a fluorometer (Carlson, fig. 1), wherein said excitation system includes a collimator (39) for forming said collimated beam (since lens 39 collimates the beam it is a collimator).

Re claim 6: Bentsen as modified by Carlson teaches a fluorometer (Bentsen, fig. 5), wherein said excitation source (472 and 473) comprises a plurality of LEDs arranged in a generally rectangular and at least one dimensional array (Bentsen, col. 27, lines 43-48 and col. 28, lines 19-23).

Re claim 8: Bentsen as modified by Carlson teaches a fluorometer (Bentsen, fig. 1b), wherein said modulating means is arranged to amplitude modulate said beam (Bentsen, col. 24, lines 55-57).

Re claim 9: Bentsen as modified by Carlson teaches a fluorometer (Bentsen, fig. 1b), wherein said modulating means is arranged to modulates said beam by adjusting

the power supply of the excitation source in accordance with said modulating signal (Bentsen, col. 24, lines 65-67 and col. 25, lines 1-3).

Re claim 10: Bentsen as modified by Carlson teaches a fluorometer (Carlson, fig. 1), wherein said at least one lens (39) of said excitation system is arranged to cause said beam is to be generally conical in shape (cylinder), said beam diverging in a direction away from said fluorometer (most collimated beams do not have perfectly parallel rays, therefore there will be some divergence of the rays as the beam travels farther and farther from the fluorometer).

Re claim 12: Bentsen as modified by Carlson teaches a fluorometer (Bentsen, fig. 1b), wherein said light receiving and converting means comprises a photodetector (Bentsen, col. 25, lines 41-43).

Re claim 15: Bentsen as modified by Carlson teaches a fluorometer (Bentsen, fig. 1c), wherein said at least one lens (346, 344, 343, and 349) of said detection system is arranged to provide a generally conical detection volume for the detection system, said detection volume converging in a direction towards said fluorometer (Bentsen, see fig. 1c the beam is cone like in shape, where the thicker portion is at the specimen and the narrow portion is at the detection system).

Re claim 16: Bentsen as modified by Carlson teaches a fluorometer (Bentsen, fig. 1b), wherein said light receiving and converting means (342) is located substantially at the focal point of the nearest to said light receiving and converting means of said at least one lens (349) (Bentsen, see fig. 1b).

Re claim 18: Bentsen as modified by Carlson teaches a fluorometer (Bentsen, fig. 1b), wherein said detecting means (340) is arranged to detect, in the electrical signal produced by said light receiving and converting means (342), a signal component of substantially the same frequency as said modulation frequency and substantially in phase with the modulation of said beam (col. 25, lines 4-8 and lines 39-50 and col. 26, lines 1-20).

6. Claims 1, 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokhtuev et al. (WO 03/023379) in view of Carlson et al. (US 4771629).

Re claim 1: Tokhtuev teaches a fluorometer (abstract, fig. 1-3) comprising an excitation system including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (paragraph 13); and a detection system for detecting said fluorescence (paragraph 14, lines 2-3), wherein said excitation system comprises an excitation source comprising one or 7more light emitting diodes (LEDs) (paragraph 14, lines 3-4), the excitation system further comprising at least one lens (2) arranged to cause said excitation light to form a beam that projects, during use, from the fluorometer (see fig. 2), and means for modulating (10) said beam with a modulating signal having a modulating frequency (the generators modulate current through the LEDs therefore having some modulating frequency, paragraph 14 and 35), and wherein said detection system comprises means for receiving light and for converting said received light into a corresponding electrical signal (3 and 4 in fig. 2, paragraph 14 lines 2-3), and at least one lens (2 and 22, fig. 3) arranged to direct said received light onto

said light receiving and converting means (paragraph 35, lines 8-10), and wherein said detection system further includes means for detecting (28a and b), in the electrical signal produced by said light receiving and converting means, a signal component of substantially the same frequency as said modulation frequency (paragraph 35), said detecting means including means for performing spectral analysis of said electrical signal and means for determining the value of a spectral component of said electrical signal corresponding to said modulation frequency, such that the fluorometer is capable of detecting to enable the detection of fluorescent material located remotely from the fluorometer (paragraph 35, 18, and 19, using the signal detected to find liquid composition with spectral analysis). Tokhtuev does not specifically teach the excitation system further comprising at least one lens arranged to cause said excitation light to form a substantially collimated elongate beam that projects, during use, from the fluorometer. Carlson teaches a system for chemical analysis (fig. 1), comprising an excitation system (left hand side of fig. 1), comprising an excitation source (13) and a lens (39) comprising at least one lens arranged to cause said excitation light to form a substantially collimated elongate beam that projects, during use, from the fluorometer (see fig. 1). It would have been obvious to one of ordinary skill in the art a the time the invention was made to use a lens as Carlson does with the fluorometer of Bentsen in order to increase the beam size to cover a certain area depending on the size of an object or specimen being measured to provide a fluorometer that can measure larger samples.

Re claim 20: Tokhtuev as modified by Carlson teaches a fluorometer (Tokhtuev, fig. 3), wherein the excitation system (BB) and the detection system (AA) are each provided in a respective housing (see fig. 3), the respective housings being located adjacent one another (see fig. 3) and arranged such that there is an overlap, during use, between the excitation beam emanating from the excitation system housing and the detection volume of the detection system housing (when the beams depart from the lens 2 the excitation beam will cross a detection volume formed by the lens 2, see fig. 2 as reference the beams and volume intersect).

Re claim 23: Tokhtuev as modified by Carlson teaches a fluorometer, wherein the excitation system and the detection system are located in a common housing (Tokhtuev, see fig. 2).

7. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokhtuev et al. (WO 03/023379) in view of Carlson et al. (US 4771629) as applied to claim 20 above, and further in view of Frungel et al. (US 3666945).

Re claim 21: Tokhtuev as modified by Carlson teaches a fluorometer (Tokhtuev, fig. 3), wherein the excitation system (BB) and the detection system (AA) are each provided in a respective housing (see fig. 3), the respective housings being located adjacent one another (see fig. 3) and arranged such that there is an overlap, during use, between the excitation beam emanating from the excitation system housing and the detection volume of the detection system housing (when the beams depart from the lens 2 the excitation beam will cross a detection volume formed by the lens 2, see fig. 2

as reference the beams and volume intersect). Tokhtuev as modified by Carlson do not teach a fluorometer, wherein the respective housings are adjustably interconnected so that the relative angular disposition between the respective housings may be altered such that the distance of said overlap from said respective housings is altered. Frungel teaches a fluorometer (fig. 1 and 2), wherein the respective housings (one for the light source the other for the photo sensor) are adjustably interconnected (supporting pivots, are attached to a support col. 8, lines 20-22, the housing are interconnected to each other through the support and supporting pivots) so that the relative angular disposition between the respective housings may be altered such that the distance of said overlap from said respective housings is altered (col. 5, lines 72-74, see fig. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to be able to move the different housings of Tokhtuev similar to Frungel in order to control where the beam is headed and make sure that it is aligned properly for concise measurements.

Re claim 22: Tokhtuev as modified by Carlson and Frungel teaches a fluorometer (Frungel, fig. 2), wherein the respective housings lie generally in a common plane, the relative angular disposition of the housings being alterable about an axis that is substantially perpendicular to said plane (see fig. 2 the houses are rotated around a perpendicular axis to the plane in which they lie).

8. Claims 24, 26, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokhtuev et al. (WO 03/023379) as modified by Carlson et al. (US 4771629) as applied to claim 23 above, and further in view of Michael (US 4005605).

Re claim 24: Tokhtuev as modified by Carlson teaches a fluorometer (Tokhtuev , fig. 2), wherein said common housing comprises a window (Tokhtuev , area where lens 2 is placed) and at least one inner chamber (1), at least part of the excitation system (5 and 6) and at least part of the detection system (3 and 4) being located in said at least one inner chamber (1), said at least part of the excitation system being arranged so that said beam is projected, during use, out of the housing through said window (Tokhtuev, see fig. 2). Tokhtuev as modified by Carlson does not teach the fluorometer, wherein said at least part of the detection system facing away from said window, and wherein a reflecting surface is located inside the housing facing said window and beyond the detection system with respect to said window, said reflecting surface being arranged to direct light entering, during use, said housing through said window onto said detection system. Michael teaches an infrared thermometer (fig. 2 and 3), wherein said common housing (see fig. 2) comprises a window (34) and at least one inner chamber (the area where the detector 38 and the mirror 28 are located), at least part of the detection system (38) being located in said at least one inner chamber (the area where the detector 38 and the mirror 28 are located), said at least part of the detection system facing away from said window (element 38 is facing away from the window), and wherein a reflecting surface (28) is located inside the housing facing said window (28 is facing the window) and beyond the detection system with respect to said window (the

reflecting surface is beyond 38 sensor), said reflecting surface being arranged to direct light entering, during use, said housing through said window onto said detection system (28 directs light to the detection system 38). It would have been obvious to one of ordinary skill in the art to use the detection and mirror system in Michael (fig. 2 and 3) with the fluorometer of Tokhtuev as modified by Carlson in order to place the light source and detector where ever needed inside the housing to reduce size or cost or change the locations depending on the type of measurement needed.

Re claim 26: Tokhtuev as modified by Carlson and Michael teaches a fluorometer (Tokhtuev, fig. 2), in which said at least one inner chamber (1) is located substantially on the longitudinal axis of said housing (outer shell in fig. 2).

Re claim 34: Tokhtuev as modified by Carlson and Michal teaches a fluorometer (Tokhtuev, fig. 2), wherein the device comprises at least one housing (Michael, see fig. 2), the or each housing comprising a window (Michael, 34) through which said excitation beam is projected during use (Tokhtuev, see fig. 2) and/or though which light is received during use (Michael, the infrared light from the observed source enters through the window area, fig. 2 and 3), wherein at least one reflecting surface (Michael, 28) is slidably moveable towards and away from the window of the housing in which it is located (Michael, see fig. 3, the mirror is tilted toward the window).

9. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokhtuev et al. (WO 03/023379) as modified by Carlson et al. (US 4771629) and

Michael (US 4005605) as applied to claim 24 above, and further in view of Lazzara (US 3996476).

Re claim 25: Tokhtuev as modified by Carlson and Michael teaches a fluorometer, wherein said at least part of the excitation system (Tokhtuev, 5 and 6) and said at least part of the detection system (Tokhtuev, 3 and 4) are located substantially next to one another within said housing (Tokhtuev, see fig. 2 and 3). Tokhtuev as modified by Carlson and Michael do not teach a fluorometer, wherein said at least part of the excitation system and said at least part of the detection system are located substantially co-axially with one another within said housing. Lazzara teaches a photoelectric detector (fig. 2 and 3), wherein said at least part of the excitation system (13) and said at least part of the detection system (17) are located substantially co-axially with one another within said housing (as seen in both figures the source and detecting device are co-axial). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the positioning of light source and detection device of Lazzara with the fluorometer as taught by Tokhtuev as modified by Carlson and Michael in order to reduce the size of the fluorometer therefore reducing the cost and creating a device that could be used in smaller areas.

10. Claims 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokhtuev et al. (WO 03/023379) as modified by Carlson et al. (US 4771629) as applied to claim 23 above, and further in view of Bernstein et al. (US 4496839).

Re claim 27: Tokhtuev as modified by Carlson teaches a fluorometer (Tokhtuev, fig. 2 and 3), wherein said common housing (Tokhtuev, outer shell in fig. 2) comprises a window (Tokhtuev, area with lens 2) and at least two inner chambers (Tokhtuev, AA and BB in fig. 3), at least part of the excitation system being located in a first inner chamber (Tokhtuev, AA is the LED) and at least part of the detection system being located in a second inner chamber (Tokhtuev, BB is the photodiode), said at least part of the excitation system being arranged so that said beam is projected, during use, out of the housing through said window (Tokhtuev, see fig. 3), said second inner chamber being located next to said first inner chamber (Tokhtuev, AA is next to BB) with respect to said window (Tokhtuev, area with lens 2), said at least part of the detection system facing towards said window (Tokhtuev, BB the photodiodes are facing the window area see fig. 3). Tokhtuev as modified by Carlson does not teach the fluorometer, wherein said second inner chamber being located beyond said first inner chamber with respect to said window, and wherein a reflecting system is located between the first and second inner chambers and is arranged to direct light entering, during use, said housing through said window onto said detection system. Bernstein teaches a spectroscopy device (fig. 1), wherein said common housing (surround all elements in fig. 1 except 18, 36, 38, 42, 44) comprises a window (where beams are exiting) and at least two inner chambers (inside collecting optics and behind collecting optical), at least part of the excitation system (16, 14, and 12) being located in a first inner chamber (beam emitted from 16) and at least part of the detection system (26) being located in a second inner chamber (behind collecting optics), said at least part of the excitation system being

arranged so that said beam is projected, during use, out of the housing through said window (see fig. 1), said second inner chamber being located beyond said first inner chamber with respect to said window (26 is beyond (behind) collecting optics, window portion is in the front of the collecting optics), said at least part of the detection system facing towards said window (see fig. 1), and wherein a reflecting system (22 and 24) is located between the first and second inner chambers and is arranged to direct light entering, during use, said housing through said window onto said detection system (see fig. 1). It would have been obvious to one of ordinary skill in the art to use the mirror system in Bernstein with the fluorometer of Tokhtuev as modified by Carlson in order to place the light source and detector where ever needed inside the housing to reduce size or cost or change the locations depending on the type of measurement needed.

Re claim 28: Tokhtuev as modified by Carlson and Bernstein teaches a fluorometer (Bernstein, fig. 1), wherein said reflecting system comprises a first reflecting surface (22), facing towards said window (see fig. 1) and a second reflecting surface (24) facing away from said window (see fig. 1), the first reflecting surface being arranged to direct light entering, during use, said housing through said window onto said second reflecting surface, said second reflecting surface being arranged to direct said light onto said detection system (see fig. 1 and beam direction).

Re claim 29: Tokhtuev as modified by Carlson and Bernstein teaches a fluorometer (Bernstein, fig. 1), wherein said first reflecting surface (22) is shaped to define an aperture (the hole in surface), said detection system being positioned to receive light from said second reflecting surface through said aperture (see fig. 1).

Re claim 30: Tokhtuev as modified by Carlson and Bernstein teaches a fluorometer, wherein said reflecting system comprises a Cassegrainian mirror system (Bernstein, the mirror system with 22 and 24 with the hole in 22 is a Cassegrainian mirror system).

11. Claims 31 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokhtuev et al. (WO 03/023379) as modified by Carlson et al. (US 4771629) as applied to claim above, and further in view of Chudnovsky (US 6157033).

Re claim 31: Tokhtuev as modified by Carlson teaches a fluorometer (Tokhtuev, abstract, fig. 1-3) comprising an excitation system including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (Tokhtuev, paragraph 13); and a detection system for detecting said fluorescence (Tokhtuev, paragraph 14, lines 2-3), wherein said excitation source comprises one or more light emitting diodes (LEDs) (Tokhtuev, paragraph 14, lines 3-4) associated with means for causing said excitation light to form a beam that projects (2 and 22), during use, from the fluorometer to enable the detection of fluorescent material located remotely from the fluorometer (Tokhtuev, see fig. 1). Tokhtuev as modified by Carlson does not teach a fluorometer, further including a laser device carried by the fluorometer and positioned to project, during use, a laser beam in a direction generally parallel, or aligned, with the excitation beam. Chudnovsky teaches a leak detection system (fig. 1), further including a laser device (12) carried by the fluorometer and positioned to project, during use, a laser beam in a direction generally parallel, or aligned, with the excitation

beam (col. 3, lines 18-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the laser pointer of Chudnovsky with the fluorometer of Tokhtuev as modified by Carlson in order to direct the excitation beam to certain locations for precision measurements.

Re claim 35: Tokhtuev as modified by Carlson teaches a fluorometer (Tokhtuev, abstract, fig. 1-3) comprising an excitation system including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (Tokhtuev, paragraph 13); and a detection system for detecting said fluorescence (Tokhtuev, paragraph 14, lines 2-3), wherein said excitation source comprises one or more light emitting diodes (LEDs) (Tokhtuev, paragraph 14, lines 3-4) associated with means for causing said excitation light to form a beam that projects (Tokhtuev, 2 and 22), during use, from the fluorometer to enable the detection of fluorescent material located remotely from the fluorometer (Tokhtuev, see fig. 1) and wherein said detection system further includes, or is associated with, means for detecting (28a and b), in the electrical signal produced by said light receiving and converting means, a signal component of substantially the same frequency as said modulation frequency (Tokhtuev, paragraph 35). Tokhtuev as modified by Carlson does not teach a fluorometer, further including means for determining the amplitude of said signal component, and means for generating an alarm when said amplitude exceeds a threshold. Chudnovsky teaches a leak detection system (fig. 1), further including means for determining the intensity of said signal component, and means for generating an alarm when said intensity exceeds a threshold (col. 2 and 3, lines 66-67 and lines 1-

29). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the alarm system of Chudnovsky with the fluorometer device of Tokhtuev as modified by Carlson in order to have a way of communicating results or information found by the device to the user operating the device.

12. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokhtuev et al. (WO 03/023379) as modified by Carlson et al. (US 4771629) as applied to claim 1 above, and further in view of Field (US 20050174793).

Re claim 32: Tokhtuev as modified by Carlson teaches a fluorometer (Tokhtuev, see fig. 1-3), wherein fluorometer comprises at least one housing (Tokhtuev, outer shell fig. 2), the each housing comprising a window through which said excitation beam is projected during use (Tokhtuev, area with lens 2, see fig. 2) and/or though which light is received during use (Tokhtuev, see fig. 2). Tokhtuev as modified by Carlson does not teach wherein said excitation source is slidably moveable towards and away from the window of the housing in which it is located. Field teaches a light source device (fig. 1 and 2), wherein a light source (18) is slidably moveable towards and away from the window (16) of the housing (10) in which it is located (see fig. 1 and 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a moveable light source as in Field with the fluorometer of Tokhtuev as modified by Carlson in order to control how the beam passes through the window area, whether as a collimated beam or focused on a point, dependent on the type of measurement needed.

13. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokhtuev et al. (WO 03/023379) as modified by Carlson et al. (US 4771629) as applied to claim 1 above, and further in view of Zielke et al. (US 3554653).

Re claim 33: Tokhtuev as modified by Carlson teaches a fluorometer (Tokhtuev, see fig. 1-3), wherein fluorometer comprises at least one housing (Tokhtuev, outer shell fig. 2), the each housing comprising a window through which said excitation beam is projected during use (Tokhtuev, area with lens 2, see fig. 2) and/or though which light is received during use (Tokhtuev, see fig. 2). Tokhtuev does not teach at least one lens of said lens system is slidably moveable towards and away from the window of the housing in which it is located. Zielke teaches an autocollimator (fig. 1), wherein at least one lens (7) of said lens system is slidably moveable towards and away from the window (lens 2) of the housing in which it is located (see fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the moveable lens of Zielke with the fluorometer of Tokhtuev as modified by Carlson in order to control how the beam passes through the window area, whether as a collimated beam, focused on a point, moved to a different location, dependent on the type of measurement needed.

14. Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokhtuev et al. (WO 03/023379) as modified by Carlson et al. (US 4771629) as applied to claim 1 above, and further in view of Geiger (US 5947051).

Re claim 36: Tokhtuev as modified by Carlson teaches a fluorometer (Tokhtuev, fig. 1-3) for use under water (Tokhtuev, abstract). Tokhtuev does not teach a vehicle for use underwater, the vehicle carrying a fluorometer. Geiger teaches an underwater vehicle, the vehicle carrying a fluorometer (col. 28, lines 1-17, fig. 24). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the fluorometer of Tokhtuev as modified by Carlson on the underwater vehicle of Geiger in order to find leaks in steal structures under the water.

Re claim 37: Tokhtuev as modified by Carlson and Geiger teaches a vehicle (Geiger fig. 24), wherein the vehicle includes at least one first moveable structure for carrying, during use, a camera (Geiger, 36) or lamp, the fluorometer (197 and 198) being carried by a second moveable structure, wherein said at least one first moveable structure and said second moveable structure are coupled electrically and/or mechanically so that the movement of the second structure is synchronized with the movement of said at least one first structure (Geiger, 56 is a robotic arm between the two structure holding the fluorometer 197 and 198 and the camera 36).

Response to Arguments

15. Applicant's arguments with respect to claims 1, 3-6, 8-10, 12, 15, 16, 18, and 20-37 have been considered but are moot in view of the new ground(s) of rejection.

Regarding the Applicant's argument that Tokhtuev does not teach detecting "a signal component of the electrical signal that corresponds to the modulation frequency by spectral analysis and to determine the value of the spectral component of the

electrical signal corresponding to the modulation frequency" (page 13, lines 11-13). Examiner disagrees with the above statement. In paragraph 35 of the prior art, Tokhtuev teaches the detectors detect a pulsed photocurrent, which is proportional to a spectral signal given by the specimen after being hit with a pulsed light beam. Tokhtuev's fluorometer detects the modulated signal of the emission beam reflected off of a specimen and converts it to an electric signal that is amplified and analyzed. Therefore the detectors read the same modulation frequency as the modulation that is provided to the emitters.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER BENNETT whose telephone number is (571)270-3419. The examiner can normally be reached on Monday - Friday 0730 - 1700 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. B./

/Georgia Y Epps/
Supervisory Patent Examiner, Art Unit 2878